WHAT IS CLAIMED IS:

1. An FM modulator for converting an electrical signal into a frequency-modulated signal by an optical heterodyne method, comprising:

a branch portion for outputting, when said electrical signal is inputted, a phase-uninverted signal (hereinafter referred to as an in-phase signal) and a phase-inverted signal (hereinafter referred to as an opposite phase signal);

a first frequency modulation light source element (hereinafter referred to as a first FM light source element) having a property of uniquely converting an amplitude change in the inputted electrical signal into an optical frequency change of outputted light, for converting said in-phase signal into a frequency-modulated first optical signal having a center wavelength $\lambda 1$;

a second frequency modulation light source element (hereinafter referred to as a second FM light source element) having a property of uniquely converting an amplitude change in the inputted electrical signal into an optical frequency change of outputted light, for converting said opposite phase signal into a frequency-modulated second optical signal having a center wavelength $\lambda 2$; and

an optical-electrical converting portion for subjecting said first and second optical signals to optical heterodyne detection and then generating a beat signal at a frequency corresponding to a wavelength difference $\Delta\lambda(=|\lambda 1-\lambda 2|)$ between both of the optical signals.

2. The FM modulator according to claim 1, further comprising:

an amplitude adjusting portion inserted at least either between said branch portion and said first FM light source element or between said branch portion and said second FM light source element, for adjusting amplitude of the inputted electrical signal to equate frequency deviation of said first and second optical signals.

3. The FM modulator according to claim 1, further comprising:

a delay adjusting portion inserted on at least either a first route from said branch portion through said first FM light source element to said optical-electrical converting portion or a second route from said branch portion through said second FM light source element to said optical-electrical converting portion, for adjusting

propagation delay of a signal propagated on the route to equate propagation delay included in said first route and propagation delay included in said second route.

4. The FM modulator according to claim 1, further comprising:

a level adjusting portion inserted on at least either a first route from said branch portion through said first FM light source element to said optical-electrical converting portion or a second route from said branch portion through said second FM light source element to said optical-electrical converting portion, for adjusting signal power to equate an amplitude of an optical intensity modulation/direct detection component outputted by subjecting an optical intensity modulation component included in said first optical signal to square-law detection in said optical-electrical converting portion and an amplitude of an optical intensity modulation/direct detection component outputted by subjecting an optical intensity modulation component included in said second optical signal to square-law detection in said optical-electrical converting portion.

5. An FM modulator for converting an electrical signal into a frequency-modulated signal by an optical

heterodyne method, comprising:

a branch portion for outputting, when said electrical signal is inputted, a phase-uninverted signal (hereinafter referred to as an in-phase signal) and a phase-inverted signal (hereinafter referred to as an opposite phase signal);

a first light source for outputting unmodulated light with a wavelength $\lambda 1$;

a first optical phase modulating portion having a property of uniquely converting an amplitude change in the inputted electrical signal into an optical phase change of outputted light, for converting, when outputted light from said first light source is inputted, said in-phase signal into a phase-modulated first optical signal having a center frequency $\lambda 1$;

a second light source for outputting unmodulated light with a wavelength $\lambda 2$;

a second optical phase modulating portion having a property of uniquely converting an amplitude change in the outputted electrical signal into an optical phase change of inputted light, for converting, when outputted light from said second light source is inputted, said opposite phase signal into a phase-modulated second optical signal having a center frequency $\lambda 2$; and

an optical-electrical converting portion for

subjecting said first and second optical signals to optical heterodyne detection and then generating a beat signal at a frequency corresponding to a wavelength difference $\Delta\lambda (=|\lambda 1-\lambda 2|)$ between both optical signals.

6. The FM modulator according to claim 5, further comprising:

an amplitude adjusting portion inserted at least either between said branch portion and said first optical phase modulation portion or between said branch portion and said second optical phase modulation portion, for adjusting amplitude of the inputted electrical signal to equate frequency deviation of said first and second optical signals.

7. The FM modulator according to claim 5, further comprising:

a delay adjusting portion inserted on at least either a first route from said branch portion through said first optical phase modulation portion to said optical-electrical converting portion or a second route from said branch portion through said second optical phase modulation portion to said optical-electrical converting portion, for adjusting propagation delay of a signal propagated on the routes to equate propagation delay

included in said first route and propagation delay included in said second route.